A NOVEL DEVICE TO MEASURE CRITICAL FLICKER FUSION FREQUENCY

Kathleen Daetwyler, Paul Borgmeier, Kathleen Digre, Judith Warner, Donnel Creel, David Weinberg, Bradley Katz

University of Utah, Salt Lake City, UT, United States

Introduction:
A light blinking faster and faster will appear to fuse into a continuous light at a certain frequency, the critical flicker fusion frequency (CFFF). CFFF depends on an intact optic nerve and it has been demonstrated previously that diseases that affect the optic nerve, especially demyelinating diseases, also affect CFFF. The purpose of this investigation was to determine if data from a novel device, the Flicker Stick, correlated with data from another device used to measure CFFF, the Flicker Meter. The advantage of the Flicker Stick is that it is battery-powered, portable, and can be mass produced. We also conducted studies to determine the effect of ambient light, gender, laterality, and age on CFFF.

Methods:
We recruited 150 subjects (300 eyes) from the neuro-ophthalmology clinics to have CFFF tested by the Flicker Meter and the Flicker Stick. Statistical analyses were carried out to determine if a correlation existed between the data from the Stick and from the Meter. Data were also analyzed to determine if there was any effect of gender, age, or laterality. The effect of ambient light was also evaluated.

Results:
We found that right eyes and left eyes had similar CFFF values and that gender had no effect on CFFF. Ambient light did not affect CFFF unless the room was completely dark, or if the test was done in shade on a sunny day. On average, subjects lost 0.05 Hz per year age (2.5 Hz per 50 years). The correlation coefficient for the two machines was 0.66 (p<0.001).

Conclusion:
The Flicker stick is a portable device that supplies data that correlate well with the Flicker Meter. The Flicker Stick may be useful for the detection of optic nerve disorders.

References:

Keywords: Critical flicker fusion frequency, Optic neuropathy, Demyelination, Optic neuritis

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